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SURVEY OF ALTERNATIVE GEOGRAPHIC DATA BASES COVERING MONTANA AND WYOMING FOR THE U.S. FISH AND WILDLIFE SERVICE GEOGRAPHIC INFORMATION SYSTEM

BY

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OFFICE OF BIOLOGICAL SERVICES INFORMATION

The Biological Services Program was established within the U.S. Fish and Wildlife Service to supply scientific information and methodologies on key environmental issues which have an impact on fish and wildlife resources and their supporting ecosystems. The mission of the Program is as follows:

1. To strengthen the Fish and Wildlife Service in its role as a primary source of information on national fish and wildlife resources, particularly with respect to environmental impact assessment.

2. To gather, analyze, and present information that will aid decisionmakers in the identification and resolution of problems associated with major land and water use changes.

3. To provide better ecological information and evaluation for Department of the Interior development programs, such as those relating to energy development.

Information developed by the Biological Services Program is intended for use in the planning and decision making process, to prevent or minimize the impact of development of fish and wildlife. Biological Services research activities and technical assistance services are based on an analysis of the issues, the decision makers involved and their information needs, and an evaluation of the state-of-the-art to identify information gaps and determine priorities. This is a strategy to assure that the products produced and disseminated will be timely and useful.

Biological Services projects have been initiated in the following areas:

Coal extraction and conversion

Power plants

Geothermal, mineral, and oil shale development

Water resource analysis, including stream alterations and western water allocation

Coastal ecosystems and Outer Continental Shelf development

Systems and inventory, including National Wetlands Inventory, habitat classification and analysis, and information transfer

The Program consists of the Office of Biological Services in Washington, D.C., which is responsible for overall planning and management; National Teams which provide the Program's central, scientific and technical expertise, and which arrange for contracting of Biological Services studies with states, universities, consulting firms, and others; Regional staff who provide a link to problems at the operating level; and staff at certain Fish and Wildlife Service research facilities who conduct in-house research studies.

DISCLAIMER

The opinions, findings, conclusions or recommendations expressed in this report are those of the authors and do not necessarily reflect the views of the Office of Biological Services, Fish and Wildlife Service, U.S. Department of the Interior, nor does mention of trade names or commercial products constitute endorsement or recommendation for use by the federal government.

ABSTRACT

This report documents the results of an extensive survey of over 400 existing data bases covering the states of Montana and Wyoming. The data bases surveyed include automated and non-automated data relating to twelve physical, biological and economic factors which are of potential value to the U.S. Fish and Wildlife Service, Region Six, as well as other state and federal natural resource planners. Data bases that fell into the following twelve subject areas were inventoried:

Soils	Topography
Geology	Socio-Economics
Climate	Wildlife Resources
Vegetation	Water Resources
Land Use	Mineral Industry Plans
Ownership	Land Management Plans

Each of the 400 data bases were evaluated in terms of subject, format, area of coverage, data vintage, spatial resolution, range of data reliability, cost and method of acquisition.

A three pronged approach was used to obtain information on data sources. This consisted of:

1. Interview with Fish and Wildlife Service to determine data needs and existing sources of data.

2. Structured questionnaires sent to over 500 potential data sources to obtain information concerning their data.

3. Personal interviews and telephone conversations to explore details of some of the more complex data sources.

All of the data bases evaluated during this task were catalogued and filed in a comprehensive manual and automated library index system. This library system and details regarding individual data bases can be obtained from the Federation of Rocky Mountain States Technical Lab, Suite 142, 333 W. Drake Road, Fort Collins, Colorado 80521.

This report further discusses the difficult process of selecting relevant data from the overabundance of varied data sources.

This report culminates the second of seven project tasks being performed under contract to the U.S. Department of the Interior, U.S. Fish and Wildlife Service, Office of Biological Services, Western Energy and Land Use Team (WELUT).

LIST OF ACRONYMS USED IN THIS REPORT

ASCS - Agricultural Stablization and Conservation Service

BAO - Billings Area Office of U.S. Fish and Wildlife Service

BLM - Bureau of Land Management

BR - Bureau of Reclamation

FRMS - Federation of Rocky Mountain States, Inc.

FS - U.S. Forest Service

FWS - U.S. Fish and Wildlife Service

GIS - Geographic Information System

LETA - Local Environmental Test Area (25 mile corridor on the Tongue River in MT)

NPS - National Park Service

RETA - Regional Environmental Test Area (coal mining area in SE Montana and NE Wyoming).

SCS - Soil Conservation Service

SETA - State Environmental Test Area (all of Wyoming)

USGS - U.S. Geological Survey

WELUT - Western Energy and Land Use Team , Office of Biological Services, FWS.

1.0 INTRODUCTION

1.1 Goal of Project

This project is defined and sponsored by the Western Energy and Land Use Team (WELUT) to promote more effective consideration of fish and wildlife resources in the numerous state and federal decisions concerning western land, energy, mineral and water resources.

The goal of this two year project is to develop an operational capability within the U.S. Fish and Wildlife Service (FWS) to accept, store, manipulate, and output spatially related data for use in a variety of FWS programs. This includes not only the data that has been and will continue to be collected by the FWS, but also includes data available in computerized and non-computerized data files of other federal and state natural resource management agencies. This goal is to be achieved with minimal development of new computer software and minimal hardware requirements. The project will start on a prototype basis within selected test case areas and will broaden to other applications.

The primary operational level users of this system in its developmental stages are in the Billings Area Office (BAO) of the U.S. Fish and Wildlife Service. The biologists in this office are faced with the weekly task of assessing the wildlife resource impacts of various land use changes. This project will attempt to develop simple, usable practical tools for operational use at the regional and area office level.

This report culminates the second of seven project tasks. Other technical reports will be produced as the system development proceeds.

1.2 Scope of this Report

Involved in the development of any Geographic Information System (GIS) is an assessment of the availability of data. In any GIS, the results are no better than the data used. In the operation of a production mode GIS, the choice between data sources becomes a major decision, in terms of cost and spatial resolution.

In many projects the poor definition of data needs causes cost over-runs, encoding of unnecessary data, or missing necessary data. For example, it is quite costly to collect and encode fifty or sixty data items and at the end of the project to find that only ten items were used.

In an attempt to aid in this difficult data needs and selection process, a library system has been established. The 400 data bases described in this report have been filed so that appropriate data can be selected for any natural resource study in Montana or Wyoming. Other data bases may be added to the library system in the future within the WELUT Data Support Center. This library of 400 data bases is currently available through the Federation of Rocky Mountain States, Suite 142, One Drake Park, 333 W. Drake Road, Fort Collins, Colorado 80521.

This report is divided into the following five sections:

Section 1.0 of this report provides an overview of the entire WELUT-2 project and defines the primary objective of this report.

Section 2.0 describes a basic approach an FWS user can take to select and acquire data for a particular problem.

Section 3.0 describes a set of criteria for evaluating data bases for FWS needs.

Section 4.0 summarizes the availability of data covering the states of Montana and Wyoming on a source-by-source basis.

Section 5.0 describes the three test cases (SETA, RETA, and LETA) and the data being evaluated for each test case.

2.0 APPROACH FOR DATA ACQUISITION

The purpose of this section is to describe an approach that an FWS user can take to select and acquire needed data for a particular spatial problem.

2.1 Description of Process

Figure 2.1 outlines the process for determining (and collecting) the data needed to resolve a particular natural resource planning problem.

2.1.1 Problem Objective. The first step in the process (see Figure 2.1) is to determine what is the problem? Data needs cannot be defined without a complete and explicit statement of the project scope, degree of spatial detail desired, budget and resource constraints.

2.1.2 Describing Data Needs. The next step of the process describes data needs. Either by research into the subject or by best professional judgment, one would indicate the types of information or data needed to analyze the given problem. The subject, resolution, format, area of coverage, and vintage of the needed data should be defined as precisely as possible at this time. These criteria will be described in more detail in Section 3.0 of this report.

2.1.3 Data Search. After data needs have been established, the data search follows. This search usually is a random process of telephone calls, looking through recent environmental impact statements, etc.

However, using the library system established within this project, the data search is greatly simplified. Data from within and without any one agency can be quickly identified. This data can be acquired, modified and compiled into a specific project file.

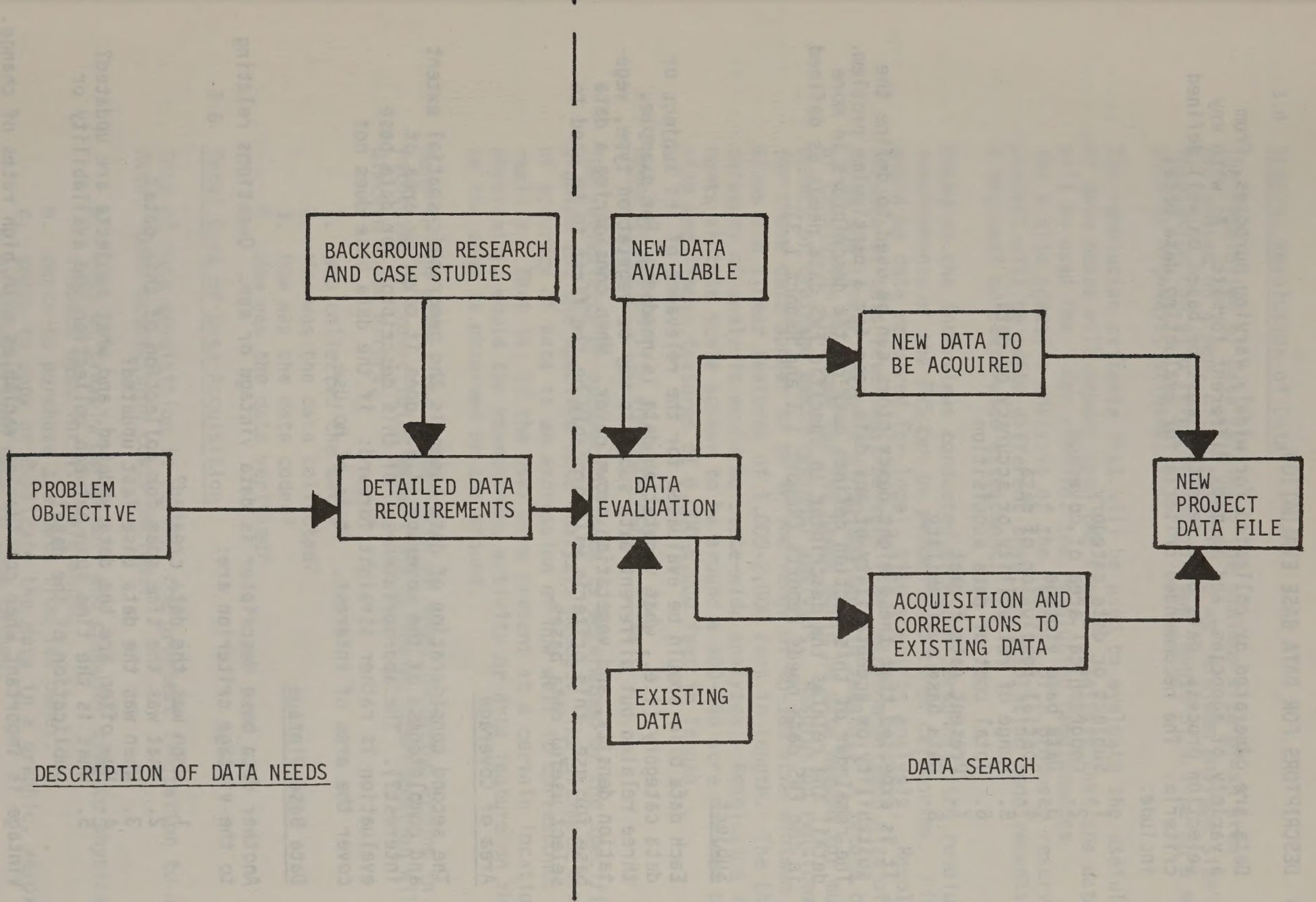

Figure 2.1 Process for data base selection and acquisition

3.0 DESCRIPTORS FOR DATA BASE EVALUATION

Data are generated or collected for widely varying purposes, from a variety of agencies, and in many different formats. As with any selection process, data base selection must be based on well defined criteria. The recommended criteria for evaluating data bases include:

1. Subject or data category
2. Geographical area of coverage
3. Data base vintage
4. Spatial resolution of data
5. Range of reliability or accuracy of data
6. Total cost of data acquisition
7. Present data format
8. Data base availability

It is expected that these eight descriptors can be used to define the suitability or acceptability of any data base for a particular problem. The remainder of this section defines each of the descriptors in more detail and relates the descriptor to specific FWS data needs as defined in the FWS data needs reports (Report 1.1 and Report 1.3).

3.1 Subject

Each data base should be evaluated for the relevance of its subject or data category (i.e., what vegetation data is needed?). For example, three related but different data subjects may be vegetation type, vegetation density, and vegetation crown cover. When considering a data base for use, this criteria will probably be the first to be used to select useful data bases.

3.2 Area of Coverage

The second consideration of data bases is the geographic-spatial extent and completeness of the coverage (i.e., does it cover my area of interest?). The appropriateness of this descriptor for data base evaluation is rather straight forward: if the data base does not cover the area of interest, it is of no use.

3.3 Data Base Vintage

Another data base descriptor is data vintage or age. Questions relating to the vintage criterion are:

1. When was the data created?
2. What was the time span for collection of this data?
3. When was the data base last updated?
4. How often are the data updated, and what subjects are updated?
5. What is the time span between collection and availability or publication of the data?

Vintage is important when considering variables with high rates of change.

3.4 Spatial Resolution of Data

The resolution of data is simply the minimum size of an area delineated on a map, often referred to as "minimum polygon size". Resolution can also refer to the minimum length of a line on a map such as highways, streams, etc.

The resolution criteria that will be used to evaluate the usefulness of data bases will depend upon the kind of analysis that the data will be used for. For example, the resolution requirements for a site specific analysis of the impacts of a proposed reservoir project will be quite different than the resolution requirements for a regional or state-wide assessment.

Based on the interviews conducted with FWS personnel, the resolution requirements of the FWS can be placed into three categories. First would be data required for local, site specific analysis. Resolution of data at this level must be very fine (minimum polygon size of 1-2½ acres and linear features of 50-100 feet in length). A second category of resolution required for FWS needs would be data needed for multi-county or drainage basin regional analysis. Resolution requirements for these data appear to be in the range of 40-160 acre minimum polygon sizes and linear features of 1,000-2,000 feet in length. The third category of analysis would be state-wide analyses. Resolution requirements at this scale appear to be around a 400-640 acre minimum polygon size and linear features of 4,000-5,000 feet in length.

3.5 Range of Reliability and Accuracy of Data

The reliability or accuracy of data is determined by the specific problem and the specific data analysis needed. The ultimate test of accuracy of data is an expression of how well it corresponds with reality. That is, if the user were present at a certain location physically, would the phenomenon, activity or data feature on the map be the same as observed on the ground.

Many things affect the reliability of data, including errors in measuring, recording or transcribing data. The following consideration will help discern these errors:

1. Who collected the data?
2. How was the data collected?
3. How was the data coded?
4. How was the data verified?

3.6 Total Cost of Data Acquisition

Cost of data acquisition is perhaps the greatest limitation to obtaining data. Data acquisition costs include:

a. cost of travel, personnel, and computer time to physically inspect data for its relevance;
b. costs to purchase the data from its owner;
c. costs to copy or duplicate the data in a graphic, xerox, or computerized tape to tape method.

d. cost to reformat the data in a form which is easily automatable;
e. costs to actually digitize, keypunch, or otherwise encode the data.

3.7 Present Data Format

Present data format is the physical form of the present data. The physical form refers to the recording medium (maps, written documents, keypunch cards, magnetic storage devices, etc.) used for storing observations, graphic symbols, or descriptive narrative.

Three basic formats of data exist: written records, graphic (photo, map), and machine readable. Written records (field notes, completed questionnaires and forms, published documents with text and tables, and manual card files) must be interpreted visually, reformatted to various degrees, and coded for computer storage and retrieval. Organized and structured written records are easier and less costly to encode than are unorganized sporatic written records such as field notes. The cost of coding unorganized written records is impractical except where its information content is of great value.

The second format of data are graphic records which range from uninterpreted aerial photographs to printed maps. Uncontrolled aerial photos are often used as a base for mapping, with subsequent transfer to computer coding sheets or some standard base map.

The characteristics of graphic records that should be considered include:

1. spatial rectification and homogeneity of scale;
2. presence or absence of geodetic references (latitude/longitude, grid ticks, control points, etc.);
3. physical size of the map sheets;
4. stability of base material (all maps printed on paper are unstable)
5. conformation to national map accuracy standards.

The third type of data format, machine readable records, consist of punch cards, paper tape, magnetic tape, disks, and other storage devices. These types of data are the most easily used by a GIS because of its compatible format. However, many technical considerations beyond the scope of this report pertain to this format.

3.8 Data Base Availability

The availability of data is based on: (1) the physical existence of the data, and (2) the ability to actually obtain and use data. The assumption that data exists or can readily be obtained is often erroneous. A reliable data base, available on a continuing or recurring basis and at reasonable cost, is most ideal. In reality, numerous legal, administrative, and physical restraints limit the availability of data. For example, some data such as corporate mineral exploration information are subject to levels of confidentiality. Other U.S. Census Bureau data are restricted because of small sample sizes.

4.0 INITIAL LIST OF DATA SOURCES

The purpose of this section is to give the FWS data searcher a starting point when looking to outside sources for data. Searching for relevant data should always begin with a complete survey of data that already exists in FWS files to avoid unnecessary expenditures of time, effort, and money. Only after a complete analysis of existing files has been conducted should one consult outside sources.

As indicated in interviews and workshops held during Task I of this project, many FWS personnel simply are unaware of many data sources. If this obstacle is cleared, the task of data acquisition can be greatly simplified. Lists of potential suppliers of data are useful as a key to sources of general categories of information. The partial listing of potential data suppliers in Tables 4.1 and 4.2 contain an overview of the available data sources in Montana and Wyoming. This list is intended to provide only a general starting point for the gathering of more detailed information found in Appendix A & B.

4.1 Summary of Types of Data Available from Various Data Sources

A three-pronged approach was used to obtain data source information for the Fish and Wildlife Service problems. This consisted of:

1. Interviews with FWS groups to determine data needs and existing sources of data.
2. Structured questionnaires sent to potential data sources to obtain information concerning their data.
3. Personal interviews and telephone conversations to explore details of some of the more complex data sources.

Based on interviews with some 20 FWS groups (Report 1.3) there appear to be a number of data subjects needed by FWS programs and projects. Most of the data subjects required fall into the following 12 general categories.

1. Soils
2. Geology
3. Climate
4. Ownership
5. Vegetation
6. Land Use
7. Topography
8. Socio-Economic Data
9. Wildlife
10. Water Resources
11. Mineral Industry Data
12. Land Management Plans

A general overview of the data sources for these 12 general categories and a summary of the characteristics of data available are found in Tables 4.1 and 4.2. Details concerning these data sources are included in Appendix A for Montana and Appendix B for Wyoming.

	Soil Conservation Service	Forest Service	Bureau of Reclamation	Bonneville Power Admin.	Pacific Northwest River Basins Comm.	MT. Dept. of Natural Resources & Conservation	MT. Dept. of Highways	MT. Ag. Experiment Station	MT. Dept. of Community Affairs	National Park Service	Dept. of Defense, Def. Mapping Agency	U.S. Geological Survey	Bureau of Land Management	MT. Bureau of Mines & Geology	MT. Dept. of State Lands	Nat'l Weather Service	MT. Dept. of Health & Environmental Sciences	Agricultural Stabliza-tion & Cons. Service	Army Corps of Engineers	U.S. Dept. of Commerce, Census Bureau	Fish and Wildlife Service	MT. State Game & Fish Dept.	Environmental Protection Agency	Bureau of Mines	Northern Great Plains Resource Program
Soils	X	X	X	X	X	X	X	X	X																X
Geology	X	X	X	X		X	X					X		X					X						X
Climate	X			X	X											X	X								X
Ownership													X												X
Vegetation	X	X		X		X			X				X		X										X
Land Use	X																	X							
Topography		X	X		X					X	X	X	X	X											
Socio-Econ. Data									X											X					X
Wildlife	X	X		X	X								X								X	X			
Water Resources	X	X			X							X							X				X		
Mineral Industry Data												X												X	X
Land Mgt. Plans		X								X			X												

TABLE 4.1 DATA AVAILABLE FOR MONTANA
(X denotes potential source of data)

	Soil Conservation Service	Forest Service	Bureau of Reclamation	Bonneville Power Administration	Pacific Northwest River Basins Comm.	WY State Extension Service	Nat'l Park Service	Dept. of Defense, Def. Mapping Agency	U.S. Geological Survey	Bureau of Land Management	Dept. of Geology, Univ. of Wyoming	WY Environmental Quality Dept.	Nat'l Weather Service	Ag. Stablization and Conservation Service	Army Corps of Engineers	WY State Geol. Survey	US Dept. of Commerce, Census Bureau	Fish and Wildlife Service	WY State Game & Fish Dept.	Environmental Protection Agency	Univ. of WY Water Resource Research Inst.	Bureau of Mines	Northern Great Plains Resource Program
Soils	X	X	X	X	X	X																	X
Geology	X	X	X	X	X				X						X	X							X
Climate	X			X	X							X	X										X
Ownership										X													X
Vegetation	X	X	X							X	X	X											X
Land Use	X										X			X									
Topography		X	X		X		X	X	X	X													
Socio-Econ. Data																	X						X
Wildlife	X	X		X	X					X								X	X				
Water Resources	X	X			X			X				X			X					X	X		
Mineral Industry Data									X	X						X						X	X
Land Mgt. Plans		X					X			X													

TABLE 4.2 DATA AVAILABLE FOR WYOMING

(X denotes potential source of data)

5.0 DATA BASE EVALUATION FOR THREE TEST CASES

5.1 Objectives of the Three Test Cases

The three test cases in the Wyoming/Montana area (Report 1.4) are being run to demonstrate the processes and results of a Geographic Information System working at three different spatial scales, state-wide, multi-county, and site specific. These test cases are:

1. SETA - State Environmental Test Area (all of Wyoming)

2. RETA - Regional Environmental Test Area (coal mining area in southeast Montana and northeast Wyoming)

3. LETA - Local Environmental Test Area (25 mile corridor on the Tongue River in Montana)

The area of coverage for the three test cases is illustrated in Figure 5.1.

One of the most difficult tasks in spatial analysis is to decide upon the map characteristics required to solve a particular problem. If the scale is too small, insufficient detail is available to resolve the problem; too large a scale will provide too much detail at a high cost.

The three test cases (SETA, RETA, and LETA) will demonstrate characteristics of data required when working at different scales.

5.2 Potential Data Bases for the Three Test Cases

Before specific data bases can be selected for use or encoding, it is imperative to determine exactly what potential data bases are available and the characteristics of that data. While Section 4.0 of this report gives the reader a general description of the types of data available from various sources, the purpose of this section is to describe in more detail the individual data bases potentially applicable to SETA, RETA, and LETA. The form being used to record the characteristics of individual data bases is illustrated in Appendix C. Due to the number of data bases being evaluated for the three cases, a detailed description of each is not included in this report. An unannotated version of Appendix C describing individual data bases is available in a separate report to those interested parties.

All of the data bases being evaluated - an excess of 400 data bases (as illustrated in Appendix C) are being catalogued and filed in a comprehensive, partially manual, partially automated library system. This system for catalogueing and filing information of potential data bases will be described in Report 2.4, entitled "Users Manual for FWS Spatial Data Library System".

5.3 Summary

As evident from this report, there is an enormous amount of data available from various sources and all with different characteristics. This report does not attempt to look at every map or piece of spatial data available for Montana and Wyoming. Rather, it explains a basic approach for evaluating data bases and also gives the FWS data searcher a place to start in his or her search (Appendix A & B). This report also contains a detailed description of data bases being evaluated by FRMS for the three FWS-GIS test cases (Appendix C). The selection of individual data bases from these potential data bases will be presented in Report 3.1.

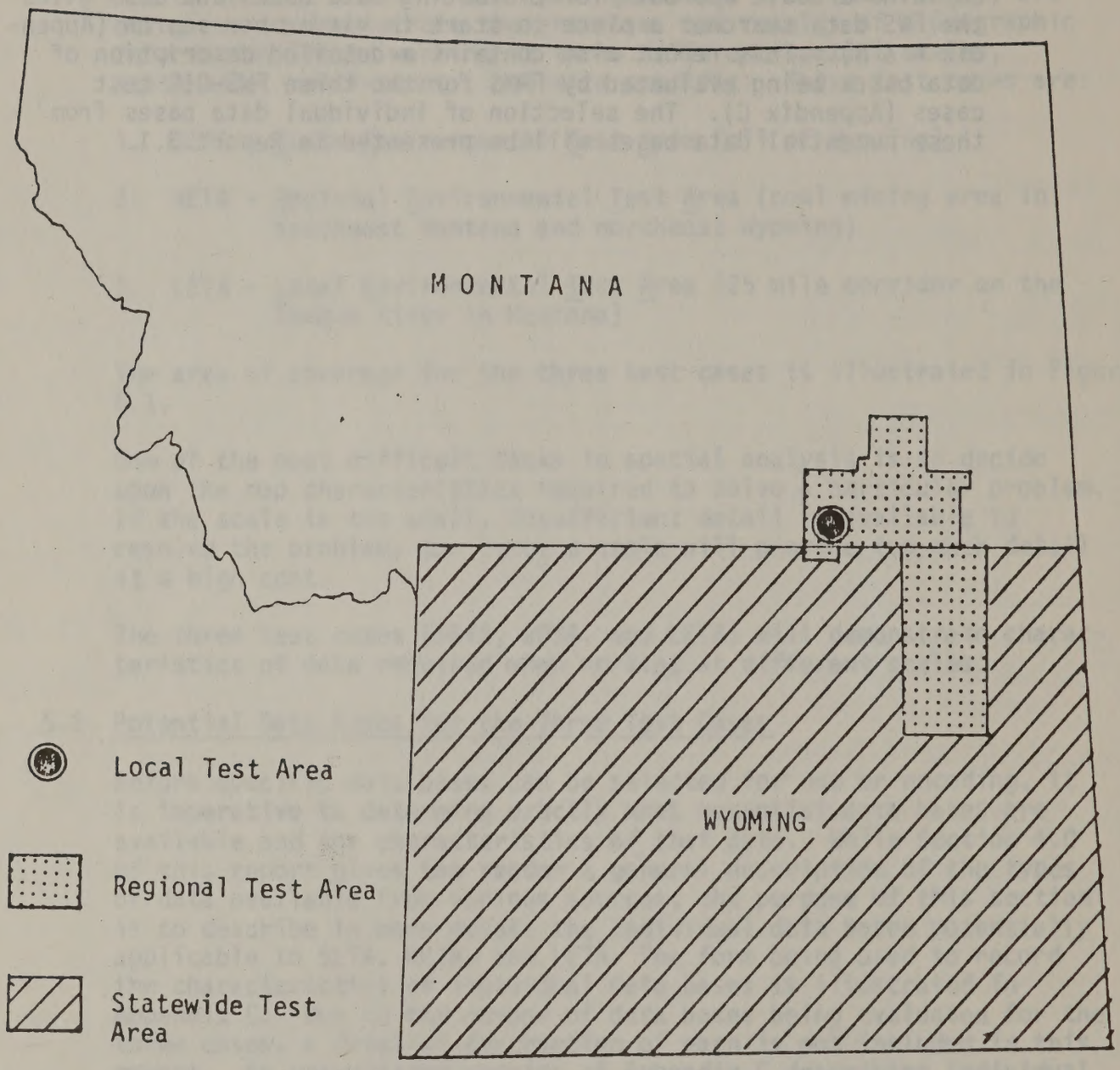

Figure 5.1 Location of the three test areas chosen to demonstrate a geographic information system for the U.S. Fish and Wildlife Service.

APPENDIX A

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Soils	SCS	Non-Restricted	Map, Written	Free	General soil data for entire state, soil surveys for approximately 60% of counties	160 min. for General soil data. 1 acre for soil survey 1:500,000 1:20,000 & 1:24,000	Jack Rogers SCS Bozemann, MT
Soils	Forest Service	Non-Restricted	Map, Written	Free	National Forests throughout state	scale=2"/mile	Robert H. Torheim Florence Hotel 120 W. Front St. Missoula, MT 59801
Soils	BR	Non-Restricted	Map, Written	Free	Specific project areas around reservoirs	scale = 1:24,000	R.L. McPhail Bureau of Rec. P.O. Box 2553 316 N. 26th St. Billings, MT 59103
Soils	Bonneville Power Adm.	Non-Restricted	Written, machine readable	Free	West of Divide	1:62,500 1:150,000	John Hoosen Environ. Coordinator Div. of Env & Con. BPA, Box 362 Portland, OR 97208

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Soils	Pacific Northwest River Basin Comm.	Non-Restricted	Maps, Written	charge for maps & report	West of Continental Divide	1:500,000 1:1,500,000	Donel J. Lane 1 Columbia River P.O. Box 908 Vancouver, WA 98660
Soils	Montana Dept. of Natural Resources & Conservation	Non-Restricted	Map	free	based on existing SCS soil surveys	1:24,000	John C. Orth DNRC 32 S. Ewing Helena, MT 59601
Soils	Montana Dept. of Highways	Non-Restricted	Map	free	specific project areas	1"/80' 1"/100' 1"/200' 1"/400' or 1"/mile	Ken Davis MT. Dept. of Highways Helena, MT 59601
Soils	Montana Ag. Experiment Station	Non-Restricted	Map	free	state-wide	1:1,000,000	Carl. C. Hoffman MT. State Univ. Bozeman, MT 59715

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Soils	Montana Dept. of Community Affairs	non-restricted	machine readable	cost of tape	dependent upon SCS soil surveys	NA	Tom Dundas Dept. of Comm. Affairs. Helena, MT
Soils	Northern Great Plains Resources Program	non-restricted	map	free	eastern Montana	1:1,000,000	NGPRP Rm. 820B, Bldg.67 Denver Fed. Center Denver, CO 80225

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Geology	SCS	non-restricted	tabular referenced to soil maps	free	available for approx. 60% of the counties	scale 1:20,000 and 1:24,000	Mr. Blaine O. Haderlie, USDA-SCS, State Director Fed. Ofc. Bldg., PO Box 2440 Casper, WY 82601
Geology	Forest Service	non-restricted	maps and written	free	National Forests throughout the state	2"/mile	Robert Torheim Region 1 Northern Region Federal Bldg. Missoula, MT 59805
Geology	USGS	non-restricted	maps, written & machine readable	cost for certain reports & maps	state-wide	1:24,000 and 1:250,000	USGS Distribution Center, Fed. Center Denver, CO
Geology	BR	non-restricted	map and written	free	specific project areas	1:24,000	R.L. McPhail Bureau of Rec. P.O. Box 2553 316 N. 26th St. Billings, MT. 59103

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Geology	Bonneville Power Administration	non-restricted	map and written	free	West of Continental Divide	1:62,500 and 1:250,000	John Hoosen Environ. Coordinator Div. of Env & Con. BPA, Box 362 Portland, OR 97208
Geology	Army Corps of Engineers	non-restricted	written	free	specific project areas	NA	Malstrom Air Force Base, Oliver W. Harris, Civil Engineer BG 621 Great Falls, MT 59401
Geology	Pacific Northwest River Basins Comm.	non-restricted	maps and written	free	West of Continental Divide	1:500,000 and 1:1,500,000	Pac. NW. River Basins Comm. Donel J. Lane 1 Columbia River P.O. Box 908 Vancouver, WA 98660
Geology	Montana Dept. of Nat. Resources & Cons.	non-restricted	map	free	state-wide	varies	John C. Orth DNRC 32 S. Ewing Helena, MT 59601
Geology	Montana Bureau of Mines & Geology	non-restricted	map	free	statewide	varies	S.L. Groff, Dir. & State Geologist Rm. 203B, Main Hall Mt College of Min. Sci. & Tech. Butte, MT 59701

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Geology	Montana Dept. of Highways	non-restricted	map	free	specific project areas	1"/80' 1"/100' 1"/200' 1"/400' or 1"/mile	Ken Davis Montana Dept. of Highways Helena, MT 59601
Geology	Northern Great Plains Resource Program	non-restricted	map	free	eastern Montana	1:1,000,000	NGPRP, RM. 820B Bldg. 67 Denver Fed. Center Denver, CO 80225

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Climate	SCS	non-restricted	tabular referenced to soil map.	free	available for approx. 60% of the counties	scales of 1:20,000 and 1:24,000	Mr. Blaine O. Haderlie, USDA-SCS, State Director, Fed. Ofc. Bldg., PO Box 2440 Casper, WY 82601
Climate	Bonneville Power Administration	non-restricted	written and maps	free	West of Divide	scale of 1:61,500 and 1:250,000	John Hoosen Env. Coordinator Division of Env. and Conservation BPA, Box 362 Portland, OR 97208
Climate	National Weather Service	non-restricted	maps and written	free	state-wide	unknown	Grayson V. Cordell, Jr. Admin. Bldg. Helena Airport Helena, MT 59607
Climate	Pacific Northwest River Basins Comm.	non-restricted	maps and written	charge for certain reports & maps	west of Continental Divide	1:1,500,000 and 1:500,000	Pac. NW River Basins Comm. Donel J. Lane 1 Columbia River Box 908 Vancouver, WA 98660

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Climate	Montana Dept. of Health & Environmental Sciences	non-restricted	written	free	state-wide	NA	State Dept. of Health & Envir.Sci. A.C. Knight Helena, MT 59601
Climate	Northern Great Plains Resource Program	non-restricted	map	free	eastern Montana	1:1,000,000	NGPRP, Rm. 820B Bldg. 67, Denver Federal Center Denver, CO 80225

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Ownership	BLM	non-restricted	map	free	All BLM land state-wide	½"/mile and 1"/mile	Edwin Zaidlicz Federal Bldg. 222 N. 32 St. P.O. Box 30157 Billings, MT 59107
Ownership	Northern Great Plains Resource Program	non-restricted	map	free	eastern Montana	1:1,000,000	NGPRP, Rm. 820B Bldg. 67, Denver Federal Center Denver, CO 80225

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Vegetation	SCS	non-restricted	tabular referenced to soil maps	free	available for approx. 60% of the counties	scale of 1:20,000 and 1:24,000	Jack Rogers SCS Bozeman, MT
Vegetation	Forest Service	non-restricted	maps and written	free	National Forests in state	2"/mile scale	Robert Torheim USFS, Region 1 Northern Region Federal Bldg. Missoula, MT 59805
Vegetation	BLM	non-restricted	maps	free	All Bureau of Land Management land in state	½"/mile 1"/mile	Edwin Zaidlicz Federal Bldg. 222 N. 32 St. P.O. Box 30157 Billings, MT 59107
Vegetation	Bonneville Power Administration	non-restricted	written & maps	free	West of Divide	1:62,500 1:250,000	John Hoosen Env. Coordinator Div. of Env.& Con BPA, Box 362 Portland, OR 97208

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Vegetation	Montana Dept. of Nat. Resources & Cons.	non-restricted	map	free	state-wide	Timber maps at 4"/mile	John C. Orth DNRC 32 S. Ewing Helena, MT 59601
Vegetation	Montana Dept. of State Lands	non-restricted	map and written	free	statewide and special project areas	varies	Leo Berry, Jr. Acting Commissioner Dept. of State Lands, Capitol Bldg. Helena, MT 59601
Vegetation	Montana Dept. of Community Affairs	non-restricted	machine readable	cost of tape	W. Central Montana and SW Montana	1:62,500 or 1:125,000	Tom Dundas Dept. of Comm. Affairs Helena, MT
Vegetation	Northern Great Plains Resource Program	non-restricted	map	free	eastern Montana	1:1,000,000	NGPRP, Rm. 820B Bldg. 67, Denver Federal Center Denver, CO 80225

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Land Use	ASCS	non-restricted	map on air photos	free	entire state only agricultural areas	varies	Leo Kolstad MT. State ASCS Office P.O. Box 670 Bozeman, MT 59715

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Topography	NPS	Non-Restricted	Map on Air Photo	Free	National Parks	1 acre minimum	Richard Kiegle Nat'l Park Serv. PO Box 25287 Denver, CO 80225
Topography	Dept. of Defense, Defense Mapping Agency	Non-Restricted	Machine readable tapes	Free from FCCC. Cost if not available	Entire State	elevation every 208.33 feet on the ground	USFS, Ft. Collins Computer Center, Ft. Collins, CO 80521
Topography	USGS	Non-Restricted	Maps	Charge for paper maps	Entire State	1:250,000 scale for entire state 1:23,000 for approx. 90%	USGS Map Distribution Center, Federal Center
Topography	USFS	Non-Restricted	Map	Free	National Forests	2"/mile	USFS, Region I Robert Torheim Northern Region Federal Bldg. Missoula, MT 59805
Topography	BLM	Non-restricted	Map	Free	All BLM lands	½"/mile 1"/mile	Edwin Zaidlicz Federal Bldg. 222 N. 32 St. P.O. Box 30157 Billings, MT 59107

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Topography	BR	Non-Restricted	Map	Free	Specific BR project areas	1:24,000	R.L. McPhail Bureau of Rec. P.O. Box 2553 316 N. 26th St. Billings, MT 59103
Topography	Pacific Northwest River Basins Comm.	Non-Restricted	Maps, Written	charge for some maps & reports	West of Continental Divide	1:500,000 1:1,500,000	Pac. NW River Basins Comm. Donel J. Lane 1 Columbia River P.O. Box 908 Vancouver, WA 98660
Topography	Montana Bureau of Mines & Geology	non-restricted	map	free	state-wide	varies	S.L. Groff Bureau of Mines and Geology, Room 203-B Main Hall Montana College of Mineral Sci. and Technology Butte, MT 59701

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Socio-Economic Data	U.S. Dept. of Commerce, Bureau of the Census	non-restricted	written	cost of publication	State-wide down to city & county data	NA	Richard C. Burt Den. Regional Ofc. 575 Union Blvd. Denver, Colo.
Socio-Economic Data	Montana Dept. of Community Affairs	machine non-restricted	machine readable	cost of tape	state-wide	NA	Tom Dundas Dept. of Community Affairs Helena, MT 59601
Socio-Economic Data	Northern Great Plains Resource Program	non-restricted	map	free	eastern Montana	1:1,000,000	NGPRP, Rm. 820B Bldg. 67, Denver Federal Center Denver, CO 80225

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Wildlife (Wildlife Distribution)	FS	non-restricted	map	free	National Forests throughout state	2"/mile	Robert Torheim Region 1 Federal Bldg. Missoula, MT 59805
Wildlife (Wildlife Distribution)	Fish and Wildlife Service	non-restricted	map and written	free	state-wide	varies	Burton W. Rounds, Area Manager, FWS Rm. 3041A Fed. Bldg. & U.S. Courthouse 316 N. 26th St. Billings, MT 59101
Wildlife (Wildlife Distribution)	BLM	non-restricted	map	free	state-wide coverage of BLM lands	½"/mile 1"/mile	Edwin Zaidlicz Federal Bldg. 222 N. 32 St. P.O. Box 30157 Billings, MT 59107
Wildlife (Distribution)	Montana State Game & Fish Dept.	non-restricted	written & some maps	free	General data for entire state, detailed surveys for specific sites	1:500,000 1:126,720	Jim Posewitz Montana State Game & Fish Dept. Helena, MT

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Wildlife (Habitat)	SCS	non-restricted	tabular referenced to soil survey	free	Approximately 60% of counties	1:20,000 and 1:24,000	Jack Rogers SCS Bozeman, MT
Wildlife (Habitat)	FWS	non-restricted	maps	free	varies	varies	Burton Rounds, Area Manager, FWS Room 3041A Fed. Bldg. 316 N. 26th St. Billings, MT 59101
Wildlife (Habitat)	FS	non-restricted	map and written	free	National Forests throughout state	2"/mile	Robert Torheim Region 1 Federal Bldg. Missoula, MT 59805
Wildlife (Habitat)	BLM	non-restricted	map	free	state-wide all BLM lands	½"/mile and 1"/mile	Edwin Zaidlicz Federal Bldg. 222 N. 32 St P.o. Box 30157 Billings, MT 59107
Wildlife (Habitat)	Pacific Northwest River Basins Comm.	non-restricted	written and map	free	West of Continental Divide	1:1,500,000 and 1:500,000	Pac. NW River Basins Comm. Donel J. Lane 1 Columbia River P.O. Box 908 Vancouver, Wa 98660

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Wildlife (Habitat)	Bonneville Power Administration	non-restricted	written and map	free	west of Divide	1:62,500 1:150,000	John Hoosen Environ. Coordinator, Div. of Env. and Cons. BPA, Box 362 Portland OR 97208
Wildlife (Habitat)	Montana State Game & Fish Dept.	non-restricted	written and some maps	free	General data for entire state, detailed surveys for specific sites	varies	Jim Posewitz Montana State Game & Fish Dept. Helena, MT

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Wildlife (Endangered Species Location)	FWS	non-restricted	map and written	free	state-wide	varies	Burton Rounds Area Manager, FWS Rm. 3041A Federal Bldg. 316 N. 26th St. Billings, MT 59101

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Wildlife (Migratory Waterfowl Data)	FWS	non-restricted	map and written	free	state-wide	varies	Burton Rounds, Area Manager, FWS Rm. 3041A Federal Bldg. 316 N. 26th St. Billings, MT 59101

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Water Res. (Surface Water physical & biological characteristics)	SCS	non-restricted	tabular referenced to map	free	available for approx. 60% of the counties in the state	1:20,000 and 1:24,000	Jack Rogers SCS Bozeman, MT
Water Res. (Surface Water physical & biological characteristics)	FS	non-restricted	map and tabular	free	National Forests throughout state	2"/mile	Robert Torheim Region 1 Federal Bldg. Missoula, MT 59805
water Res. (Surface Water physical & biological characteristics)	USGS	non-restricted	maps, written	may be some cost	state-wide	1:250,000 1:24,000	USGS Map Distribution Center, Federal Center
(Surface Water physical & biological characteristics) Water Res.	Environmental Protection Agency	non-restricted	written	free	state-wide	NA	John A. Green Regional Admin. Rm. 9001 1860 Lincoln Denver, CO

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Water Res. (Surface Water physical & biological characteristics)	Army Corps of Engineers	non-restricted	written	free	specific project areas & state-wide	varies	Oliver W. Harris, Civil Engineer Malmstrom A.F. Base BG 621 Great Falls, MT 59401
Water Res. (Surface Water physical & biological characteristics)	Pacific Northwest River Basins Comm.	non-restricted	map and written	free	West of Continental Divide	1:1,500,000 & 1:500,000	John Hoosen Env. Coordinator Div of Env. & Cons. BPA, Box 362 Portland OR 97208

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Mineral Industry Data	USGS	non-restricted	map and written	charge for some reports & maps	state-wide	varies	John L. Heller, Chief Publications Div. Rm. D2217 Bg. 20, Fed. Center Denver, CO 80225
Mineral Industry Data	Bureau of Mines	non-restricted	map and written	free	state-wide	1"/20' 1"/50' and 1"/100'	Ralph L. Hay Ofc. of the Dir. BG 20, Denver Federal Center Denver, CO 80225

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN MONTANA

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Land Management Plans	BLM	non-restricted	map and written	free	state-wide BLM lands	½"/mile 1"/mile	Edwin Zaidlicz Federal Bldg. 222 N. 32 St P.O. Box 30157 Billings, MT 59107
Land Management Plans	FS	non-restricted	map and written	free	National Forests throughout state	2"/mile	Robert Torheim Region 1 Federal Bldg. Missoula, MT 59805
Land Management Plans	NPS	non-restricted	map and written	free	National Parks throughout state	1:24,000	Richard Keigle NPS P.O. Box 25287 Denver, CO 80225

APPENDIX B

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Soils	SCS	Non-Restricted	Map, Written	Free	General soil data for entire state, soil surveys for approximately 60% of counties	160 min. for General soil data. 1 acre for soil survey 1:500,000 1:20,000 & 1:24,000	Mr. Blaine O. Haderlie, USDA-SCS, State Director, Federal Office Bldg., P.O. 2440, Casper, WY 82601
Soils	Forest Service	Non-Restricted	Map, Written	Free	Nat. Forests throughout state	scale=2"/mile	Region 2 Craig Rupp 11177 W. 8th Ave. Box 25127 Lakewood, CO 80225 & Vern Hamre, 324 25th St. Ogden, UT 84401
Soils	BR	Non-Restricted	Map, Written	Free	Specific project areas	scale = 1:24,000	Joe D. Hall Room 2725 Bldg. 20 Denver Fed. Center Denver, CO 80225
Soils	Bonneville Power Adm.	Non-Restricted	Written, machine readable	Free	West of Divide	1:62,500 1:150,000	John Hoosen Envir. Coordinator Div. of Env. and Conservation BPA, Box 362 Portland OR 97208

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Soils	Pacific Northwest River Basin Comm.	Non-Restricted	Maps, Written	charge for maps & report	West of Continental Divide	1:500,000 1:1,500,000	Pac. NW River Basins Comm. Donel J. Lane 1 Columbia River P.O. Box 908 Vancouver, WA 98660
Soils	Wyoming State Extension Service	non-restricted	map and written	free	General soil maps for entire state, soil surveys for approximately 60% of the counties	1:500,000 1:20,000 1:24,000	Neal Hilston, Dir. Univ. Station Box 3354 Laramie, WY 82071

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Geology	SCS	non-restricted	tabular referenced to soil maps	free	available for approx. 60% of the counties	scale 1:20,000 and 1:24,000	Mr. Blaine O. Haderlie, USDA-SCS, State Director Fed. Ofc. Bldg., PO Box 2440 Casper, WY 82601
Geology	Forest Service	non-restricted	maps and written	free	National Forests throughout the state	2"/mile	Craig Rupp, 11177 W. 8th Ave, Box 25127, Lakewood, CO 80225, & Vern Hamre, 324 25 St. Ogden, UT 84401
Geology	USGS	non-restricted	maps, written & machine readable	cost for certain reports & maps	state-wide	1:24,000 and 1:250,000	USGS Distribution Center, Fed. Center Denver, CO
Geology	BR	non-restricted	map and written	free	specific project areas	1:24,000	Joe D. Hall Room 2725 Bldg.20 Denver Fed. Center Denver, CO 80225

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Geology	Bonneville Power Administration	non-restricted	map and written	free	West of Continental Divide	1:62,500 and 1:250,000	John Hoosen Envir. Coordinator Div. of Environ. & Conservation BPA, Box 362 Portland OR 97208
Geology	Army Corps of Engineers	non-restricted	written	free	specific project areas	NA	Rocky Mt. Area Area Engineer 250 S. Academy Blvd. Colo. Spgs., CO 80902
Geology	Pacific Northwest River Basins Comm.	non-restricted	maps and written	free	West of Continental Divide	1:500,000 and 1:1,500,000	Pac. NW River Basin Comm. Donel J. Lane 1 Columbia River P.O. Box 908 Vancouver, WA 98660
Geology	Wyoming State Geological Survey	non-restricted	map	charge for certain maps	Portions throughout the state	varies by area	Daniel N. Miller, Jr. Geol. Survey Univ. of Wyoming Box 3008 Univ. Station Laramie, WY

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GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Climate	SCS	non-restricted	tabular referenced to soil map.	free	available for approx. 60% of the counties	scales of 1:20,000 and 1:24,000	Mr. Blaine O. Haderlie, USDA-SCS, State Director, Fed. Ofc. Bldg., PO Box 2440 Casper, WY 82601
Climate	Bonneville Power Administration	non-restricted	written and maps	free	West of Divide	scale of 1:61,500 and 1:250,000	John Hoosen Environmental Coordinator, Div. of Env. & Cons. BPA, Box 362 Portland OR 97208
Climate	National Weather Service	non-restricted	maps and written	free	state-wide	unknown	Gale McQuate, Principal Assis. 4000 Morrie Ave. Cheyenne, WY 82001
Climate	Pacific Northwest River Basins Comm.	non-restricted	maps and written	charge for certain reports & maps	west of Continental Divide	1:1,500,000 and 1:500,000	Pac. NW River Basin Comm. Donel J. Lane 1 Columbia River P.O. Box 908 Vancouver, WA 98660
Climate	Wyoming Environ. Quality Dept.	non-restricted	map	free	state-wide	1:24,000 & 1:1,200	Glen Catchpole Dept. of Env. Quality Cheyenne, WY

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Ownership	BLM	non-restricted	map	free	All BLM land state-wide	½"/mile and 1"/mile	Daniel Baker Joseph O'Mahoney Federal Center Cheyenne, WY 82001

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Vegetation	SCS	non-restricted	tabular referenced to soil maps	free	available for approx. 60% of the counties	scale of 1:20,000 and 1:24,000	Mr. Blaine O. Haderlie, USDA-SCS, State Director, Fed. Ofc. Bldg., PO Box 2440 Casper, WY 82601
Vegetation	Forest Service	non-restricted	maps and written	free	National Forests in state	2"/mile scale	Craig Rupp, 11177 W. 8th Ave. Box 25127 Lakewood, CO 80225 & Vern Hamre, 324 25th St, Ogden, UT 84401
Vegetation	BLM	non-restricted	maps	free	All Bureau of Land Management land in state	½"/mile 1"/mile	Daniel Baker Joseph O'Mahoney Federal Center Cheyenne, WY 82001
Vegetation	Bonneville Power Administration	non-restricted	written & maps	free	West of Divide	1:62,500 1:250,000	John Hoosen Envir. Coordinator Division of Env. and Conservation BPA, Box 362 Portland OR 97108

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Vegetation	Dept. of Geology, U. of Wyo., Laramie, WY	non-restricted	maps from air photos & satellite imagery	may be charge for some publications	special project areas throughout the state	varies	Ron Marrs Dept. of Geology U. of Wyoming Laramie, WY
Vegetation	Wyoming Environmental Quality Dept.	non-restricted	map	free	special project areas throughout the state	varies	Glen Catchpole Dept. of Env. Quality Cheyenne, WY

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Land Use	ASCS		map on air photos	free	entire state only agricultural areas	varies	Gordon Vonforrell, State Exec. Dir. Rm. 3001, Fed. Bldg. 100 E. B St. Casper,WY 82601
Land Use	Dept. of Geology, U. of Wyo., Laramie, WY	non-restricted	maps from air photos & satellite imagery	may be charge for some publications	special project areas throughout the state	varies	Ron Marrs Dept. of Geology U. of Wyoming Laramie, WY

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Topography	NPS	Non-Restricted	Map on Air Photo	Free	National Parks	1 acre minimum	Richard Kiegle Nat'l Park Serv. PO Box 25287 Denver, CO 80225
Topography	Dept. of Defense, Defense Mapping Agency	Non-Restricted	Machine readable tapes	Free from FCCC. Cost if not available	Entire State	elevation every 208.33 feet on the ground	USFS, Ft. Collins Computer Center, Ft. Collins, CO 80521
Topography	USGS	Non-Restricted	Maps	Charge for paper maps	entire state.	1:250,000 for entire state	USGS Map Distribution Center, Federal Center
Topography	USFS	Non-Restricted	Map	Free	National Forests	2"/mile	Craig Rupp 11177 W. 8th Ave. Box 25127 Lakewood, CO 80225 & Vern Hamre 324 25th St. Ogden, UT 84401
Topography	BLM	Non-restricted	Map	Free	All BLM lands	½"/mile 1"/mile	Daniel Baker Joseph O'Mahoney Federal Center Cheyenne, WY 82001

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Topography	BR	Non-Restricted	Map	Free	Specific BR project areas	1:24,000	Joe D. Hall Room 2725 Bldg. 20 Denver Fed. Center Denver, CO 80225
Topography	Pacific Northwest River Basins Comm.	Non-Restricted	Maps, Written	charge for some maps & reports	West of Continental Divide	1:500,000 1:1,500,000	Pac. NW River Basins Comm. Donel J. Lane 1 Columbia River Box 908 Vancouver, WA 98660

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Socio-Economic Data	U.S. Dept. of Commerce, Bureau of the Census	non-restricted	written	cost of publication	State-wide down to city & county data	N/A	Den. Regional Ofc Richard C. Burt 575 Union Blvd. Denver, CO

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Wildlife (Distribution)	FS	non-restricted	map	free	National Forests throughout state	2"/mile	Craig Rupp, 11177 W. 8th Ave, Box 25127, Lakewood, CO 80225, & Vern Hamre, 324 25 St. Ogden, UT 84401
Wildlife (Distribution)	Fish and Wildlife Service	non-restricted	map and written	free	state-wide	varies	Burton Rounds, Area Manager, FWS Rm. 3041A, Fed. Bldg. 316 N. 26th St. Billings, MT 59101
Wildlife (Distribution)	BLM	non-restricted	map	free	state-wide coverage of BLM lands	½"/mile 1"/mile	Daniel Baker Joseph O'Mahoney Federal Center Cheyenne, WY 82001
Wildlife (Distribution)	Wyoming State Game & Fish Dept.	non-restricted	map and written	free	specific areas throughout the state	1:500,000 1:126,720	Harry Harju Game & Fish Dept. Cheyenne, WY

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Wildlife (Habitat)	SCS	non-restricted	tabular referenced to soil survey	free	Approximately 60% of counties	1:20,000 and 1:24,000	Blaine Haderlie USDA-SCS State Director Fed. Ofc. Bldg. P.O. Box 2440 Casper, WY 82601
Wildlife (Habitat)	FWS	non-restricted	maps	free	state-wide	varies	Burton Rounds, Area Manager, FWS RM. 3041A Federal Bldg. 316 N. 26th St. Billings, MT 59101
Wildlife (Habitat)	FS	non-restricted	map and written	free	National Forests throughout state	2"/mile	Craig Rupp, 11177 W. 8th Ave. Box 25127, Lakewood, CO 80225, & Vern Hamre, 324 25 St. Ogden, UT 84401
Wildlife (Habitat)	BLM	non-restricted	map	free	state-wide all BLM lands	½"/mile and 1"/mile	Daniel Baker Joseph O'Mahoney Federal Center Cheyenne, WY 82001
Wildlife (Habitat)	Pacific Northwest River Basins Comm.	non-restricted	written and map	free	West of Continental Divide	1:1,500,000 and 1:500,000	Pac. N.W. River Basin Comm. Donel J. Lane 1 Columbia River P.O. Box 908 Vancouver, Wa 98660

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Wildlife (Habitat)	Bonneville Power Administration	non-restricted	written and map	free	west of Divide	1:62,500 1:150,000	John Hoosen Envir. Coordinator Div. of Env. and Conservation BPA, Box 362 Portland OR 97208
Wildlife (Habitat)	Wyoming State Game & Fish Dept.	non-restricted	map and written	free	entire state	1:500,000 1:126,720	Harry Harju WY Game & Fish Cheyenne, Wyo. 82002

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Wildlife (Endangered Species Location)	FWS	non-restricted	map and written	free	state-wide	varies	Burton Rounds Area Manager Rm. 3041A Fed. Bldg. 316 N. 26th St. Billings, MT 59101

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Wildlife (Migratory Waterfowl Data)	FWS	non-restricted	map and written	free	state-wide	varies	Burton Rounds Area Manager Rm. 3041A Federal Bldg. 316 N. 26th St. Billings, MT 59101

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Water Res. (Surface Water physical & biological characteristics)	SCS	non-restricted	tabular referenced to map	free	available for approx. 60% of the counties in the state	1:20,000 and 1:24,000	Blain O. Haderlie USDA-SCS State Director Fed. Ofc. Bldg. P.O. Box 2440 Casper, WY 82601
Water Res. (Surface Water physical & biological characteristics)	FS	non-restricted	map and tabular	free	National Forests throughout state	2"/mile	Craig Rupp, 11177 W. 8th Ave, Box 25127 Lakewood, CO 80225, and Vern Hamre 324 25th St. Odgen, UT 84401
Water Res. (Surface Water physical & biological characteristics)	USGS	non-restricted	maps, written & machine readable	free, may be some cost for tapes	state-wide	1:24,000 1:250,000	John Heller, Chief Pub. Division Rm. D2217 BG 20 Denver Fed. Center Denver, CO 80225
(Surface Water physical & biological characteristics) Water Res.	Environmental Protection Agency	non-restricted	written	free	state-wide	NA	John A. Green Regional Admin. Rm. 9001 1860 Lincoln Denver, CO

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Water Res. (Surface Water physical & biological characteristics)	Army Corps of Engineers	non-restricted	written	free	specific project areas & state-wide	varies	Rocky Mt. Area. Area Engineer 250 S. Academy Blvd. Colo. Spgs., CO 80902
Water Res. (Surface Water physical & biological characteristics)	Pacific Northwest River Basins Comm.	non-restricted	map and written	free	West of Continental Divide	1:1,500,000 & 1:500,000	John Hoosen Env. Coordinator Div. of Env. and Conservation BPA, Box 362 Portland OR 97208
Water Res. (Surface water physical & biological characteristics)	U. of Wyo. Water Resources Research Institute	non-restricted	map and machine readable	cost of tapes	state-wide	varies	Vern E. Smith Box 3067 Univ. of Wyo. Laramie, WY 82071
(Surface Water physical & biological characteristics) Water Res,	Wyoming Envir. Quality Dept.	non-restricted	map	free	state-wide	1:24,000 & 1:1,200	Glen Catchpole Dept. of Env. Quality Cheyenne, WY

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Mineral Industry Data	USGS	non-restricted	map and written	charge for some reports & maps	state-wide	varies	John Heller, Chief Pub. Division Rm. D2217 BG 20 Den. Fed. Center Denver, CO 80225
Mineral Industry Data	Bureau of Mines	non-restricted	map and written	free	state-wide	1"/20' 1"/50' and 1"/100'	Ralph L. Hay Ofc. of the Dir. BG 20, Denver Federal Center Denver, CO 80225
Mineral Industry Data	Wyoming State Geological Survey	non-restricted	map and written	charge for certain maps	Portions throughout the state and also state-wide	1:500,000 for statewide & portions of state at various scales & resolutions	Daniel Miller, Jr. Geol. Survey Univ. of Wyoming Box 3008 University Station Laramie, WY

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Mineral Industry Data	USGS	non-restricted	map and written	charge for some reports & maps	state-wide	varies	John Heller, Chief Pub. Division Rm. D2217 BG 20 Den. Federal Center Denver, CO 80225
Mineral Industry Data	Bureau of Mines	non-restricted	map and written	free	state-wide	1"/20' 1"/50' and 1"/100'	Ralph L. Hay Ofc. of the Dir. BG 20 Den. Fed. Center Denver, CO 80225

GENERAL DESCRIPTION OF DATA BASES FOR FWS IN WYOMING

SUBJECT	SOURCE	AVAILABILITY	FORMAT	COST	AREA OF COVERAGE	SCALE AND RESOLUTION	POTENTIAL CONTACT
Land Management Plans	BLM	non-restricted	map and written	free	state-wide BLM lands	½"/mile 1"/mile	Daniel Baker Joseph O'Mahoney Federal Center Cheyenne, WY 82001
Land Management Plans	FS	non-restricted	map and written	free	National Forests throughout state	2"/mile	Craig Rupp, 11177 W. 8th Ave. Box 25127, Lakewood, CO 80225, and Vern O. Hamre 324 25th St. Ogden, UT 94401
Land Management Plans	NPS	non-restricted	map and written	free	National Parks throughout state	1:24,000	Lynn H. Thompson Regional Dir. 655 Parfet Lakewood, CO

APPENDIX C

ILLUSTRATION OF DETAILED DATA LOG BOOK PAGE

Federation of Rocky Mountain States, Inc.

FRMS - WELUT DATA SURVEY FORM

851
S 1977

(PLEASE FILL OUT A SEPARATE FORM FOR EACH DATA VARIABLE)

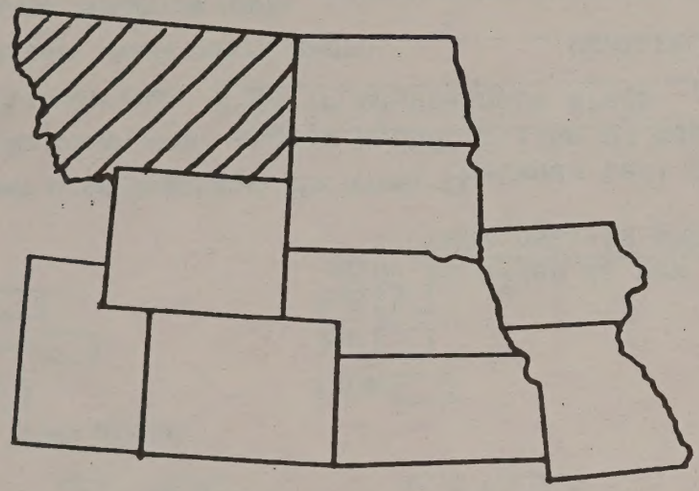
(PLEASE COMPLETE PAGE 1 FOR ALL SPATIALLY REFERENCED DATA)

1) VARIABLE NAME (SEE APPENDIX A) General Soils

2) YOUR AGENCY NAME Montana Agricultural Experiment Station

GEOGRAPHICAL REFERENCE & COVERAGE

1) PLEASE INDICATE ON THE MAP BELOW THE APPROXIMATE BOUNDARIES OF THE AREA OF COVERAGE.



IF DATA COVERAGE IS FOR MONTANA AND/OR WYOMING, PLEASE GIVE EITHER THE U.S.G.S. 1:250,000 SCALE MAP NAMES OR OUTLINE THE AREA OF COVERAGE ON THE ATTACHED INDEX MAPS.

All of Montana

SOURCE DOCUMENT CHARACTERISTICS

1) SOURCE MEDIUM (CHECK ONE)

MAPPED [X] DIGITAL IMAGERY [ ] AIR PHOTO (COLOR INFRA RED) [ ]

TABULAR [ ] AIR PHOTO (COLOR) [ ] AIR PHOTO (BLACK & WHITE) [ ]

OTHER [ ] SPECIFY _____

2) SCALE OF SOURCE?

1:24,000 [ ] 1:62,500 [ ] 1:250,000 [ ]

1:500,000 [X] 1:100,000 [ ] OTHER [X]

SPECIFY SCALE 1:1,000,000

3) LEVEL OF DETAIL OF SOURCE DOCUMENT? (MINIMUM GEOGRAPHIC AREA: 1 ACRE, 1 SQ. MI., ETC. (SEE APPENDIX B) approx. 2,000 acres

4) AGENCY THAT GENERATED SOURCE DOCUMENT? MAES with cooperation from Soil Conservation Service and Forest Service.

5) DATE WHEN SOURCE WAS GENERATED?

MO. 5 YR. 19 77

6) IF MAP OR AERIAL PHOTO WHAT GEOGRAPHIC REFERENCE MARKS OR CONTROL POINTS ARE ON DOCUMENT.

UNIVERSAL TRANS MERCATOR [ ] PUBLIC LAND SURVEY (SECTION CORNERS) [ ]

LATITUDE LONGITUDE (DEGREES, MINUTES, SEC.) [X]

STATE PLANE CO-ORDINATES (FEET) [ ] OTHER [ ] SPECIFY _____

7) IF SOURCE IS AERIAL PHOTOGRAPHY, WHAT TYPE OF RECTIFICATION HAS BEEN DONE TO PHOTOS?

STRIP RATIOING [ ] TIP AND TILT RECTIFICATION [ ]

OTHER (SPECIFY) [ ] NO RECTIFICATION [ ]
SPECIFY _____

UNKNOWN [ ]

8) IS THIS DATA VARIABLE CONFIDENTIAL OR FOR RESTRICTED USE? YES [ ] NO [X]

COMMENTS _____

PLEASE RETURN THIS INVENTORY SHEET TO:

LARRY J. SALMEN
INFORMATION SYSTEMS COORDINATOR
FEDERATION OF ROCKY MOUNTAIN STATES, INC.
SUITE 142, ONE DRAKE PARK
333 W. DRAKE ROAD
FT. COLLINS, COLORADO 80521

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Federation of
Rocky Mountain States, Inc.

AUTOMATED DATA CHARACTERISTICS

(PLEASE COMPLETE THIS SECTION FOR AUTOMATED DATA ONLY)

1) WHEN WAS THE ENCODING OF THE SOURCE DOCUMENTS BEGUN AND WHEN WAS IT COMPLETED?

BEGAN — MO. 5 19 YR. 77

not COMPLETED — MO. ___ 19 YR. ___

2) HOW OFTEN IS DATA UPDATED?

- MONTHLY [ ]
- SEMI-ANNUALLY [ ]
- ANNUALLY [ ]
- 5 YEARS [ ]
- NEVER [ ]
- OTHER [X] SPECIFY as often as new long term data is published

3) WHAT ACCURACY IS THE ENCODED DATA? (SEE APPENDIX C) between cell boundary

A) ESTIMATED BOUNDARY ERROR: approx 8,000' & line on map (FEET)

B) ESTIMATED PURITY ERROR: high in mountainous areas (PERCENT)

C) IF POINT DATA, AVERAGE SAMPLING DENSITY: _____ (POINTS PER SQ MILE)

D) IF LINE/ARC, MINIMUM LINE LENGTH: _____ (FEET)

E) IF CELL OR POLYGON, MINIMUM SIZE: 8¼ mi.^{2} (ACRES)

4) PRIMARY STORAGE MODE IN AUTOMATED FORM

- POINT [ ]
- LINE [ ]
- POLYGON [ ]
- CELL [X]
- 3D (VOLUME) [ ]
- TABULAR [ ]
- OTHER [ ] SPECIFY _____

5) AGENCY OR BRANCH CURRENTLY RESPONSIBLE FOR AUTOMATED DATA MAINTENANCE?

MAES

DATA STORAGE STRUCTURE

(PLEASE COMPLETE THIS SECTION FOR AUTOMATED DATA ONLY)

1) STORAGE MEDIUM

CARDS [ ] TAPE [X] DISK [ ] MICROFILM OR FICHE [ ] OTHER [ ]

2) VOLUME OF DATA (NO. OF ENTITIES BY STORAGE MODE - SEE APPENDIX D)

OF CARDS 550 # OF RECORDS ___ # OF CELLS approx. 17,000

OF CHARACTERS ___ # OF POLYGONS ___ OTHER SPECIFY ___

3) FREQUENCY OF USE OF THIS VARIABLE

DAILY [ ] WEEKLY [ ] UNKNOWN [X] System operational 9/77

MONTHLY [ ] ANNUALLY [ ]

ACQUISITION NOTES

(PLEASE COMPLETE THIS SECTION FOR ALL DATA)

CONTACT PERSON

YOUR NAME Paul Kesge

YOUR TITLE Extension Soil Scientist

YOUR ORGANIZATION MAES, Bozeman, MT

YOUR TELEPHONE ___

OTHER COMMENTS IF DESIRED: ___

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